

Please note that applicants have carefully reviewed the rejected claims and amended the same as necessary in order to eliminate the bases for this rejection.

In connection with the elimination of the identified passages from the original claims, applicants have added new claims 11-16, which depend from the original claims and further recite the features introduced by the "preferably" language of the original claims. Reconsideration and withdrawal of this rejection are therefore respectfully requested.

The Official Action rejects claims 1-5 and 8 under 35 USC §102(b) as being anticipated by MATUBARA et al. 5,618,452. Reconsideration and withdrawal of this rejection are respectfully requested for the following reasons.

The Official Action identifies column 2, lines 40-58 of the applied reference as disclosing the method of cutting a workpiece made of steel. Applicants note that the identified passage discloses nothing in connection with cutting, but rather welding using a laser. Further, applicants have performed an electronic word search of the applied reference, the results of which indicate that neither the word "cut" nor any known variation thereof appears in the applied reference.

Another recited feature of the present invention recited at least in independent claim 1 is the use of a multifocus optical means. The Official Action identifies the abstract, claim 3, and the narrative portion of the specification

in column 5, lines 45-55 of the reference as disclosing this and the number of other features of the present invention.

Applicants note, however, that neither the identified passage nor any other portion of the applied reference discloses the use of a multifocus laser. Further, and in stark contrast to the present invention as claimed, the reference illustrates in Figure 9 and describes in the corresponding text at column 1, lines 47-54, a laser beam head including a laser beam lens 12 and an adjustment mechanism 3 for the lens 12. The simple lens illustrated in Figure 9 and the light convergence characteristic attributed to such lens in Figure 9 clearly discloses that the laser of the reference is of the common, single-focus type, not a multifocus type as recited in the present claims.

As is known to one of skill in the art, illustrated in present Figure 1 and specifically defined in the paragraph beginning on line 15 of page 2 of the present specification, an optical means of the multifocus type describes a device that makes it possible to focus the laser beam at several focusing points separated from one another. As further noted in the paragraph beginning on line 30 of the same page in the specification, the optical means may comprise a bifocal lens, which focuses the beam at two separate focusing points.

The applied reference clearly fails to disclose this feature of the present invention recited in the present claims. The device of the reference, like the admitted prior art, focuses

the laser beam at a single point. In so doing, such reference cannot disclose the invention recited in the present claims, which provides for a laser having two separate focusing points.

The Official Action rejects claims 1 and 6 under 35 USC §102(b) as being anticipated by NAGAHORI et al. 6,316,743. Reconsideration and withdrawal of this rejection are respectfully requested for the following reasons.

In connection with the recited feature of having one focusing point positioned near the upper surface of the workpiece and a second focusing point positioned near the lower surface of the workpiece, the Official Action identifies the text in column 9, lines 15-35, and item d of Figure 1.

Applicants note, however, that the present reference, like the reference considered above in connection with the preceding anticipation rejection, teaches a single-focus laser device, as opposed to the recited multifocus laser of the present invention. This is particularly evident from the passage in column 9, lines 19-26, stating:

In FIG. 2, in the laser cutting operation, the nozzle 11 is lowered to only a distance s (see FIG. 1) from the position during the piercing operation by activating the nozzle drive mechanism M2, the lens 13 is raised only distance d (see FIG. 1) by the lens drive mechanism M1, and the focus position of the laser beam 14 is moved (raised) to a predetermined cutting focus position 14b, which is higher than the piercing focus position 14a (see FIG. 1). (Emphasis added).

As is evident from the above passage, as well as the illustration of the device of the reference in Figures 1 and 2

thereof, the laser described by NAGAHORI et al. is of the simple single-focus type, albeit an adjustable single-focus mechanism.

At any point in time, the lens 13 of the NAGAHORI et al. device focuses the laser at a single point. That single point may sometimes coincide with an upper surface of the workpiece, and at other times with a point below such surface. However, at no single point in time does the laser of the NAGAHORI et al. device have two separate focusing points, like the multifocus laser of the present invention.

For at least this reason, the NAGAHORI et al. reference, like the MATUBARA et al. reference considered above, necessarily fails to disclose the full set of features recited in claim 1 and the claims that depend therefrom.

The Official Action rejects claim 7 under 35 USC §103(a) as being unpatentable over MATUBARA et al. Reconsideration and withdrawal of this rejection are respectfully requested for the following reasons.

The applied MATUBARA et al. reference is the same reference applied in the first anticipation rejection addressed above, and the arguments offered in connection with such anticipation rejection apply with even greater force to the present obviousness rejection.

As discussed above, the applied reference teaches a common single-focus laser device. Further, the very inclusion of the adjustment mechanism 3 for the laser beam lens 12 of MATUBARA

et al. may be construed as teaching away from the multifocus device of the present invention, given that at least one use for the adjustment mechanism of MATUBARA et al. is to focus on different points in the thickness of the workpiece at different times. Such requirement is eliminated by the multifocus device of the present invention.

The Official Action rejects claim 9 under 35 USC §103(a) as being unpatentable over MATUBARA et al. in view of MCNEILL 4,781,907. Reconsideration and withdrawal of this rejection are respectfully requested for the following reasons.

The primary MATUBARA et al. device is addressed in detail in both the preceding obviousness rejection as well as the first anticipation rejection based on such reference. Applicants note that the secondary MCNEILL reference fails to overcome the shortcomings of the primary MATUBARA et al. reference.

The Official Action offers the MCNEILL reference only for its asserted teaching or suggestion of a nitrogen/oxygen mixture obtained from the air treated by a membrane system. Irrespective of such reference's ability to teach or suggest that for which it is offered, it no more teaches a multifocus laser for cutting the workpiece than does the primary reference.

In addition to the amendments described above, applicants have added new claims 17-21. Of these, claim 17 is an independent claim from which claims 18-21 depend.

In light of the amendments described above and the

arguments offered in support thereof, applicants believe that the present application is in condition for allowance and an early indication of the same is respectfully requested.

If the Examiner has any questions or requires further clarification of any of the above points, the Examiner may contact the undersigned attorney so that this application may continue to be expeditiously advanced.

Attached hereto is a marked-up version showing the changes made to the claims. The attached page is captioned "VERSION WITH MARKINGS TO SHOW CHANGES MADE."

Respectfully submitted,

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"VERSION WITH MARKINGS TO SHOW CHANGES MADE"

IN THE CLAIMS:

Claim 2 has been amended as follows:

--2. (amended) The method as claimed in claim 1, wherein the multifocus optical means is chosen from lenses, mirrors and combinations thereof [, preferably a bifocal lens].--

Claim 3 has been amended as follows:

--3. (twice amended) The method as claimed in claim 1, wherein the assist gas is an oxygen/nitrogen mixture containing at least 90% nitrogen [, preferably from 92 to 98% nitrogen].--

Claim 4 has been amended as follows:

--4. (twice amended) The method as claimed in claim 1, wherein the assist gas is oxygen containing less than 500 ppm by volume of argon as impurities [, preferably less than 100 ppm by volume of argon].--

Claim 5 has been amended as follows:

--5. (twice amended) The method as claimed in claim 1, wherein the assist gas is a nitrogen/oxygen mixture having an oxygen content greater than 0% by volume and less than 8% by volume, [preferably an oxygen content between 150 ppm by volume and 5% by volume,] the rest being nitrogen.--

Claim 6 has been amended as follows:

--6. (twice amended) The method as claimed in claim 1,

wherein the optical means is arranged so as to obtain at least one first focusing point positioned near the upper surface of the workpiece to be cut, [preferably so as to coincide with said upper surface,] or in the thickness of the workpiece to be cut in a region close to said upper surface, and at least one second focusing point positioned near the lower surface of the workpiece to be cut and in the thickness of the latter, or beyond the latter.--